WAGENINGEN UNIVERSITEIT
MAATSCHAPPIJWETENSCHAPPEN

Quantifying the effects of reforming the EU Emissions Trading System. A computable general equilibrium analysis

Or: Cost-effectiveness of EU ETS reform options

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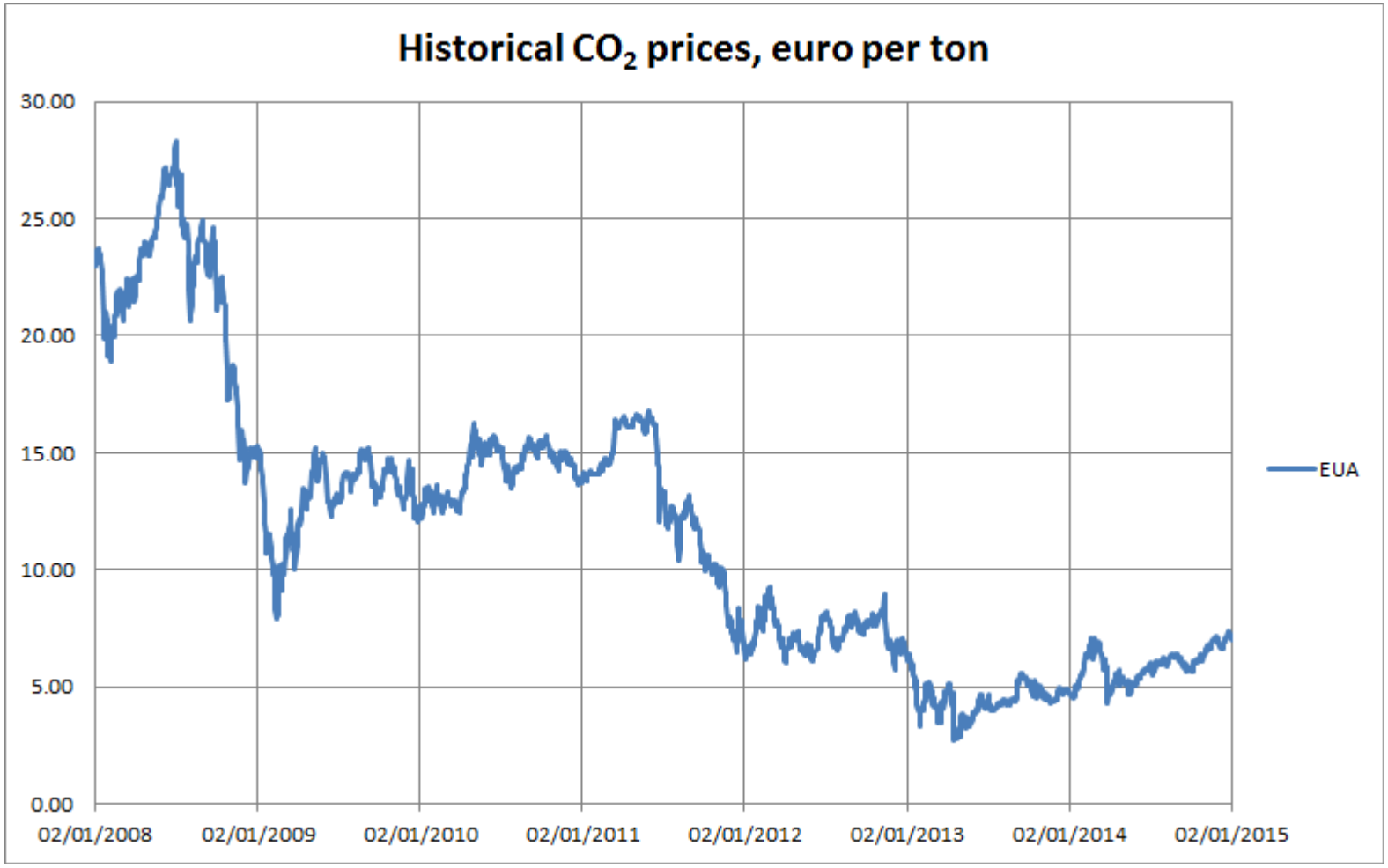
1. Why EU ETS reform?



1. Why EU ETS reform?

ETS design features underlying low price:

- Fixed supply (but low demand due to Great Recession)
- Policy interaction: additional supply from CDM and JI; lower demand tue to renewables and energy efficiency policies
- Banking provision: allowed firms to use Phase II allowances in Phase III (2013-2020)

Surplus of 2 billion allowances – equal to one year's emissions by ETS sectors

2. How EU ETS reform?

How to make EU ETS robust to future demand shocks?

Economic literature:

- Floor price – auction reserve price
- Floor price – fixed or variable tax

European Commission:

- Increase annual reduction factor (tighten cap)
- Backloading
- Market Stability Reserve

2. How EU ETS reform?

We analyse:

1. Tighter cap (linear reduction factor; 2.6 billion EUAs)
2. Permanent set aside (900 mln EUAs)
3. Auction reserve price €20 – unsold EUAs into reserve
4. Variable CO_2 tax fossil fuels on top of EUA price; sum equal to €20
   A. for power sector only (UK!)
   B. for all ETS sectors
5. Fixed €20 CO_2 tax fossil fuels for all ETS sectors

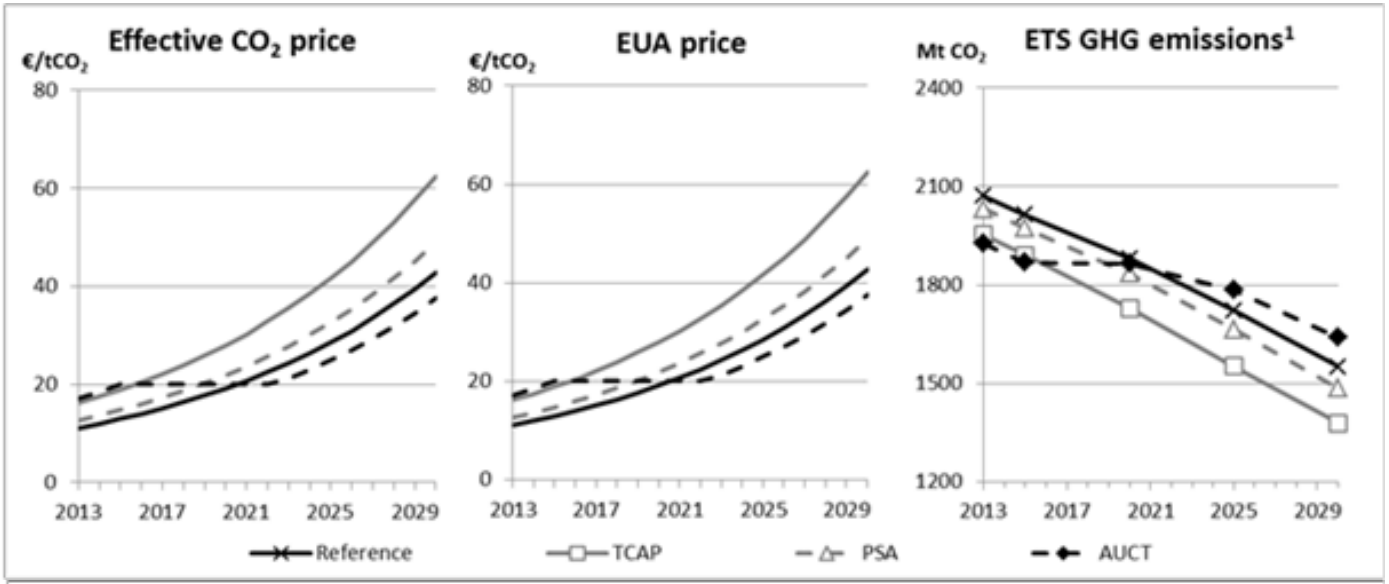
3. Method

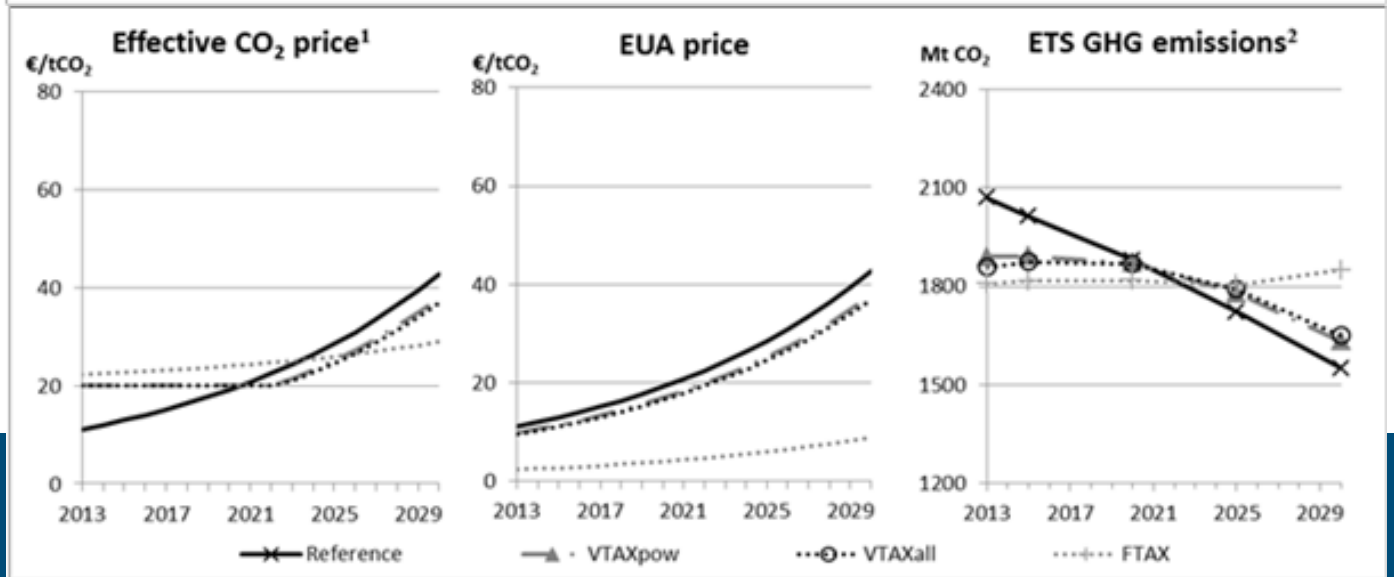
WorldScan: global multi-region, multi-sector Computable General Equilibrium model

- Detailed modelling of EU regions; energy production
- Keeps track of annual and regional supply, demand and bank of EUAs
- Recursive dynamic model, but...
- ... forward-looking behaviour on allowance market: cumulative supply (2013-2030) + surplus (2008-2012) = 2013 stock of non-renewable resource

Banking: abate and bank during years in which marginal abatement costs are low

4. Results: base model





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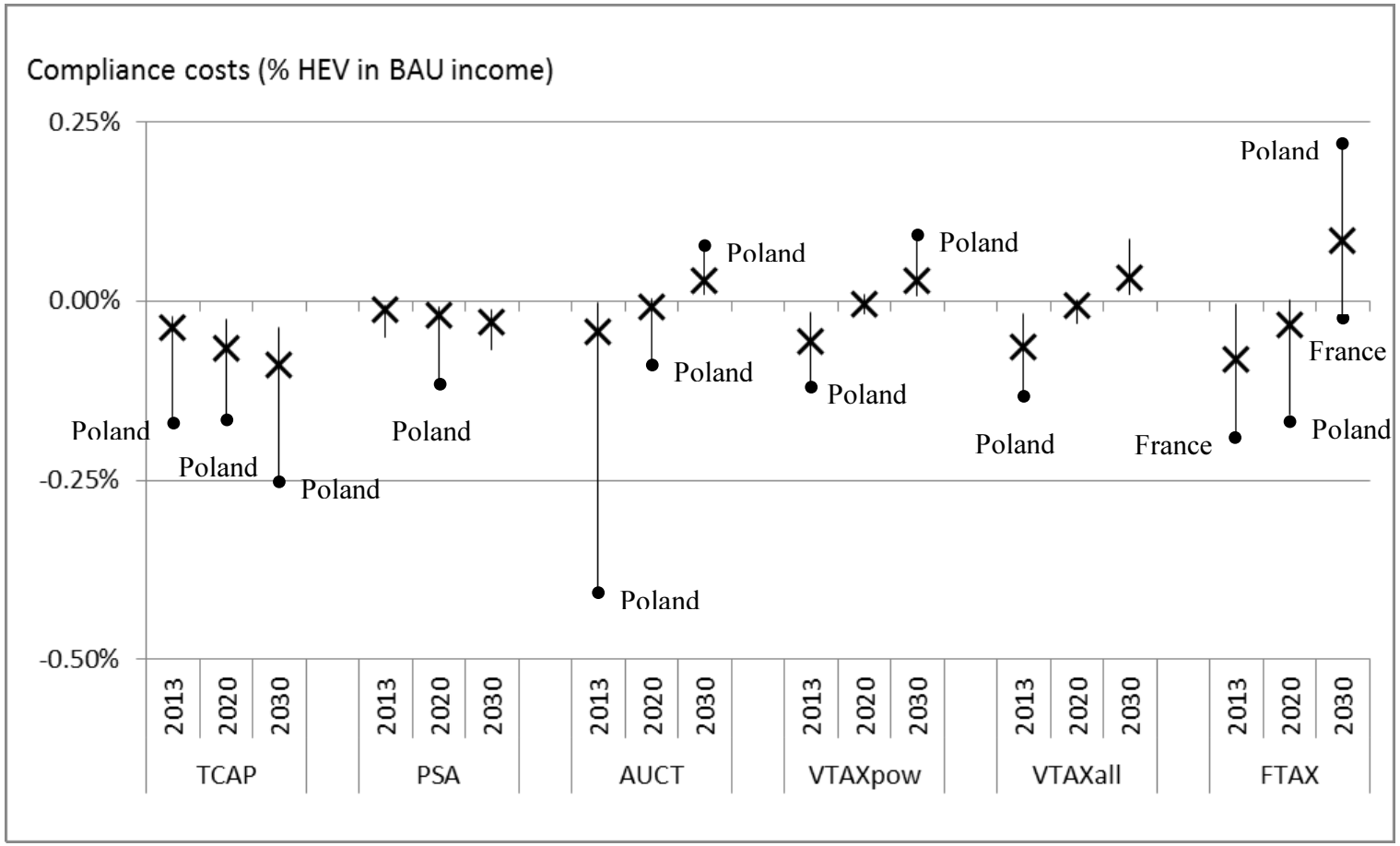
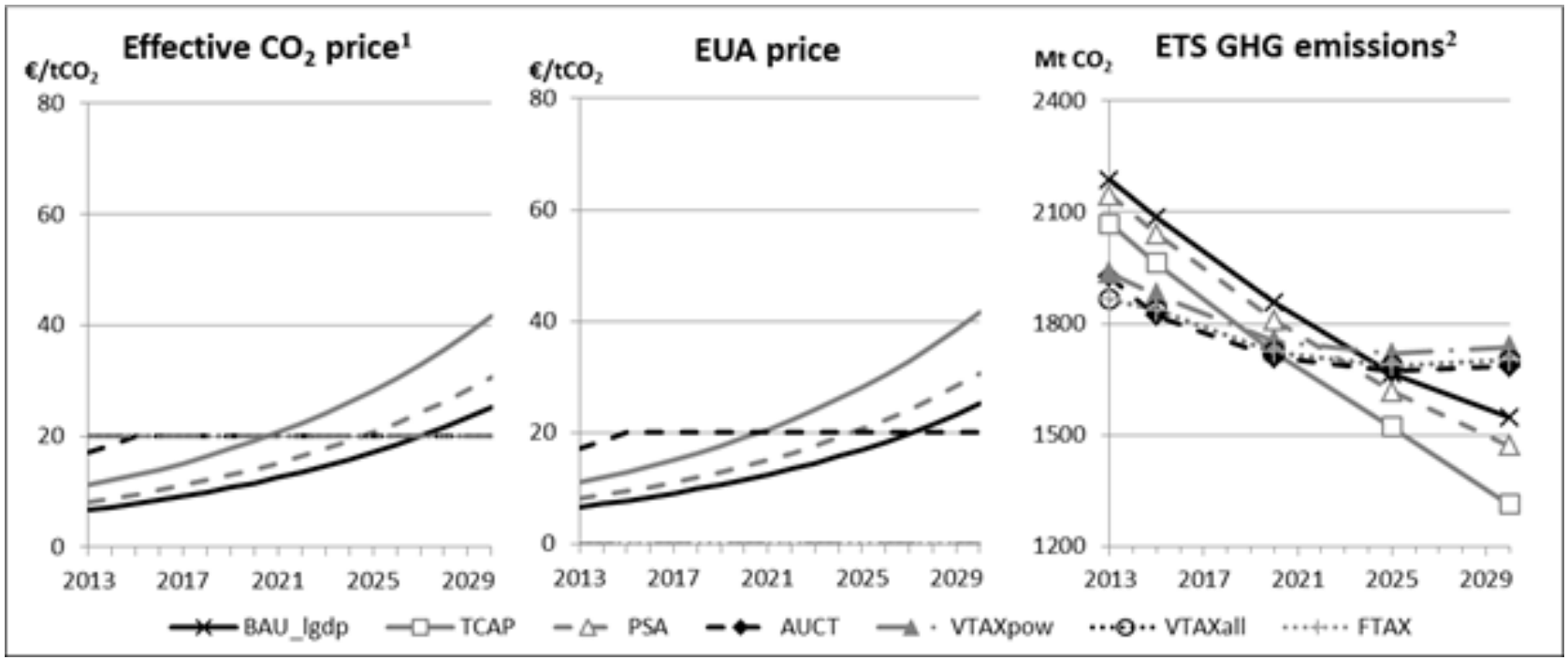


5. Robustness check: low economic growth



Note: with low growth, EUA price 40% lower; stays below €20 up to 2028

6. Conclusions

- Proposals of EC do not make ETS robust to future shocks
- Auction reserve price and fixed or variable CO_2 tax introduce effective price floor
- Auction reserve price induces dispersed compliance costs; especially in newer Member States
- Fixed tax comparable to variable tax
- Variable tax in power sector causes different MAC in different sectors: inefficient
- ...but may be politically more interesting than variable tax in all ETS sectors (which is more efficient)